

## **REMARKS**

In the office action dated May 28, 2008, the examiner rejected Claims 11, 17-22, 24, and 25 and objected to Claim 23.

### **Rejection under 35 U.S.C. §103(a)**

The examiner rejected Claims 11, 17-22, 24, and 25 under 35 U.S.C. §103(a) as being unpatentable over Graenicher, '752. The examiner states that "Graenicher teaches the instantly claimed process of heating a metal oxide in an atmosphere consisting of oxygen and water vapor and then cooling the metal oxide. See cols. 3-4 and the claims. Graenicher may differ in not stating that the process introduces local ionic defects and lithium capacity in the metal oxide. However Graenicher teaches the instantly claimed process therefore such ionic defects and lithium capacity would also be provided by the taught process. The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to select the portion of the prior art's range which is within a known range by optimization for the best results." Applicants respectfully disagree with the examiner's analysis and conclusions and submit that the examiner has not established a *prima facie* case of obviousness.

First, in order to rely on a reference under 35 USC 103, it must be analogous prior art. "Under the correct analysis, any need or problem known in the field of endeavor at the time of the invention and addressed by the patent [or application at issue] can provide a reason for combining the elements in the manner claimed." *KSR International Co. v. Teleflex Inc.*, 550 U.S. \_\_\_, \_\_\_, 82 USPQ2d 1385, 1397 (2007). Thus a reference in a field different from that of applicant's endeavor may be reasonably pertinent if it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his or her invention as a whole. While Patent Office classification of references and the cross-references in the official search notes of the class definitions are some evidence of "nonanalogy" or "analogy" respectively, the court has found "the similarities and differences in structure and function of the inventions to carry far greater weight." *In re Ellis*, 476 F.2d 1370, 1372, 177 USPQ 526, 527 (CCPA 1973) (The structural similarities and functional overlap between the structural gratings shown by one reference

and the shoe scrapers of the type shown by another reference were readily apparent, and therefore the arts to which the reference patents belonged were reasonably pertinent to the art with which appellant's invention dealt (pedestrian floor gratings).).

Here, the reference relied upon is has a class definition (Class 117/19) of CLASS 117, SINGLE-CRYSTAL, ORIENTED-CRYSTAL, AND EPITAXY GROWTH PROCESSES; NON-COATING APPARATUS THEREFOR; Subclass 19: "Forming an intended mixture (excluding mixed crystal) (e.g., doped): This subclass is indented under subclass 13. Subject matter wherein the process includes an intended or desired mixture in the single-crystal\* product, but excluding mixed crystal compositions like  $GaxAl_{1-x}As$ . The examiner relies upon a reference directed to the growth of crystals based upon a well known method involving a melt. The Graenicher patent grows single crystals by the well known Zochralski method, a process which takes place at elevated temperatures, 1250 °C as cited in the Graenicher patent (See Col. 2, lines 18-20), from a melt. Those skilled in the art would understand that common oxides do not melt until typically higher 1000° C. See 'Physical Constants of Inorganic Compounds', in *CRC Handbook of Chemistry and Physics, 88<sup>th</sup> Edition (Internet Version 2008)* at 4-72, which provides the melting point of the compound disclosed in Graenicher, lithium niobate, as 1240°C. In contrast, the present invention claims a process by which an existing material, i.e.  $V_2O_5$ , can be modified by heating at moderate temperatures (300-600° C). The specification discusses that the process is carried out on solids, not melts. No new crystals are grown in the present process. Thus, the reference is ineffective in this instance as it recites non-analogous art. Applicants respectfully submit that rejection is overcome and respectfully request allowance of the claims.

Second, the examiner states that "Graenicher may differ in not stating that the process introduces local ionic defects and lithium capacity in the metal oxide. However Graenicher teaches the instantly claimed process therefore such ionic defects and lithium capacity would also be provided by the taught process." While not directly stating it, the examiner appears to be adopting the position that the local ionic defects and increased lithium capacity is inherent in the crystals grown as disclosed in the Graenicher reference. Applicant respectfully traverses this rejection at least because the Office has not met its burden to fully develop reasons supporting its reliance on

the doctrine of inherency. It is well settled that subject matter is inherent only when extrinsic evidence makes it clear that the subject matter necessarily (i.e., inevitably) flows from a disclosure of cited art. (MPEP 2112). This requirement is a prerequisite to invoking the doctrine of inherency and cannot be avoided. "In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." Further, since a basis in fact and technical reasoning is required when inherency is invoked, a failure to provide such evidence or rationale is fatal to the reliance on this doctrine. This is only logical since evidence "must make clear" that the allegedly inherent subject matter is necessarily present in (i.e., necessarily flows from) the disclosure of cited art. (MPEP 2112). Here, the only basis supplied by the examiner is the statement "Graenicher teaches the instantly claimed process therefore such ionic defects and lithium capacity would also be provided by the taught process". However, as discussed above, Grainicher is not analogous art and does not teach the instantly claimed process, therefore, the examiner's inherency argument is insufficient to amount to a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. Applicants respectfully submit that the Office Action's reliance on inherency is unsupported and thus improper. In sum, the Office Action concedes that the Graenicher patent does not teach the feature of claim 1 and any reliance on the doctrine of inherency to provide this necessary teaching is improper.

Third, the examiner states that "the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be *prima facie* case of obviousness." However, the examiner never specified which range was being cited in the reference, nor was an exact citation to the range relied upon provided. The examiner merely cited Col. 2-3 in the office action. Applicants respectfully submit that the ranges disclosed within Graenicher are not overlapping with the present claims, thus the examiner has not established a *prima facie* case of obviousness. A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination

of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). See also *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) (prior art suggested proportional balancing to achieve desired results in the formation of an alloy). Thus, the Graenicher reference must disclose a result-effective variable, that is that the process introduces local ionic defects and lithium capacity in the metal oxide. As discussed above, that result is not inherent, and the examiner has provided no basis to support that the optimization of the ranges of Graenicher achieves the recognized result recited. Further, the only ranges disclosed in Graenicher are the temperature range for either 1) the gases in the atmosphere or 2) the melt temperature at which the single crystal is grown. The Graenicher patent grows single crystals by the well known Zochralski method, a process which takes place at elevated temperatures (1250° C in this case), from a melt. Gases are introduced having a temperature range of 22-28° C (see col. 2, line 45 and the claims). The present invention claims a process by which an existing material (a metal oxide) is modified by heating the existing material at moderate temperatures (300-600° C) under an atmosphere introduces local ionic defects and increases the lithium capacity of said metal oxide. The material (metal oxide) of the claims is not melted, as the material in Graenicher is. As discussed above, one of ordinary skill in the art would understand that common oxides do not melt until typically >1000° C. With regard to the atmosphere of the present claims, no temperature is specified because only the metal oxide itself is heated. Both the process of Graenicher (the melt) and the disclosed ranges of Graenicher are completely different from the presently claimed process and temperature ranges. Thus, the examiner has failed to establish a *prima facie* case of obviousness.

Applicants submit that the examiner's rejection has been overcome and respectfully request reconsideration. In view of the above arguments, applicant believes the pending application is in condition for allowance.

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Respectfully submitted,

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